GDT 104

A. Scope

For a complete list of GDTs, see the Table of Contents.

Use this test method to determine the percentage, by weight, of schist, phyllite or shale particles in coarse aggregates.

In this test, you manually separate schist, phyllite or shale particles by petrographic analysis and determine the percent by weight of those particles.

Referenced Documents

AASHTO Standards

M92 Wire-cloth Sieves for Testing Purposes

M231 Weighing Devices Used in the Testing of Materials

T 2 Methods of Sampling Aggregates

T 27 Method of Test for Sieve Analysis of Fine and Coarse Aggregates

T 248 Method of Test for Reducing Field Samples of Aggregate to Testing Size

B. Apparatus

The apparatus consists of the following:

1. Sample Splitter or Quartering Device.
2. Scales: Use gram scales with a minimum capacity of 5.5 lbs (2500 g) and accurate to ± 0.00022 lbs (±0.1 g).
3. Drying Device
4. Water Supply
5. Sieves: Use sieves that conform to the "Standard Specifications for Sieves for Testing Purposes," AASHTO M 92.
6. Shaker: Use a Gilson or other approved device for mechanically agitating the sieves to separate the coarse material into portions of specific sized particles.
7. Brass Rod: Use a 1/16 in (1.6 mm) diameter rod, with a rounded point, mounted in a hand held device. The brass rod should be of a hardness so when filed to a sharp point, it will scratch a U.S. copper penny but fail to scratch a U.S. nickel.

C. Sample Size and Preparation

Take a sample that is representative of the grading from the supply.

1. Perform a sieve analysis on the sample in accordance with AASHTO T 27 and discard all material that passes the No. 4 (4.75 mm) sieve. Recombine and thoroughly mix the remainder of the sample.
2. Based on the gradation as determined by AASHTO T 27 and the table below, look to the left side of the table and select the nominal maximum sieve size (the smallest sieve size that more than 90% of the sample will pass through).
3. Next, look to the top row of the table and find the largest sieve size that less than 10% of the sample will pass through. The mass (in grams) listed where the two sieve sizes intersect is the minimum mass of material to be tested.
4. In the event that more than 10% of the sample passes the No. 4 sieve (4.75 mm), use the mass listed in the row where the nominal maximum sieve size in the left column and the No. 4 sieve column intersect.
5. Reduce the sample in accordance with AASHTO T 248 to obtain the representative sample size determined from the above procedure.

Nominal Maximum Sieve Size	No 4 (4.75 mm)	3/8 in (9.5 mm)	1/2 in (12.5 mm)	3/4 in (19.0 mm)	1 in (25.0 mm)	1 1/2 in (37.5 mm)
3/8" (9.5 mm)	100					
1/2" (12.5 mm)	300	200				
3/4" (19 mm)	900	800	600			
1" (25 mm)	2400	2300	2100	1500		
1-1/2" (37.5 mm)	6900	6800	6600	6000	4500	
2" (50 mm)	18800	18600	18600	18000	16500	12000

NOTE: As well as consisting of the minimum mass that is specified above, ensure that a sample consists of at least 150 particles.

6. Wash the sample over a No. 4 (4.75 mm) sieve to remove fine material.
7. Dry the sample and allow to cool.

D. Procedures

1. Weigh the sample to the accuracy specified in Section B.
2. Spread the sample on a large enough area or work table so you can carefully examine the individual particles.
   a. By visual inspection, separate and classify the schist, phyllite or shale separately from the remainder of the sample.
      1) Wet the material or use other suitable visual aids to help you separate the sample.
      2) In the case of questionable schist, phyllite or shale particles [No. 4 (4.75 mm) and larger] that are integrated with other minerals, you may use the scratch hardness tool to determine if the particles are to be classified as schist, phyllite or shale. Any visible brass left on 2/3 or more of an individual particle scratched perpendicular to the planar structures (i.e., foliation in phyllite/schist or bedding in shale) shall be considered acceptable.

E. Calculations

1. Determine the dry total weight of particles for each sample tested.
2. Determine the dry total weight of particles for each sample classified as schist, phyllite or shale.
3. Calculate the percentage of each particle size for each sample classified as schist, phyllite or shale.
4. The calculation will be:

$$A = (B \div C) \times 100\%$$

where:

A = percent schist, phyllite or shale

B = dry weight of schist, phyllite or shale

C = total dry weight of sample

F. Report

Report results to the nearest 0.1%.